

Appl. No. 10/720,325  
Examiner: Sarkar, Asok K, Art Unit 2891  
In response to the Office Action dated September 1, 2005

Date: December 1, 2005  
Attorney Docket No. 10113251

## REMARKS

Responsive to the Office Action mailed on September 1, 2005 in the above-referenced application, Applicant respectfully requests amendment of the above-identified application in the manner identified above and that the patent be granted in view of the arguments presented. No new matter has been added by this amendment.

### Present Status of Application

Claim 1 is objected to for informalities. Claims 1, 11, 13, 14 and 29 are finally rejected under 35 U.S.C. 102(b) as being anticipated by Divakaruni (U.S. 6,440,793). Claim 12 is finally rejected under 35 U.S.C. 103(a) as being unpatentable over Divakaruni in view of Schrems (US 6,008,104). Claims 15-22 are allowed. Claims 2-10 are objected to as being dependent upon a rejected base claim but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims.

In this paper, claim 1 is amended according to the suggestion of the Examiner. Applicant submits that the objection to claim 1 is thereby overcome. Claim 29 is canceled. Therefore, on entry of this amendment, claims 1-22 remain in the application.

Reconsideration of this application is respectfully requested in light of the amendments and the remarks contained below.

### Allowable Subject Matter

Applicant thanks the Examiner for the allowance of claims 15-22 and the indication in the Office Action that claims 2-10 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims.

Applicant submits that no new matter has been added by these amendments.

### Rejections Under 35 U.S.C. 102(b)

Claims 1, 11, 13, 14 and 29 are finally rejected under 35 U.S.C. 102(b) as being anticipated by Divakaruni. Applicant respectfully traverses the rejections for the reasons as follow.

To anticipate a claim, a reference must teach every element of the claim. In this regard, the Federal Circuit has held:

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

"The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Claim 1 recites a method of fabricating a trench device structure with a single-side buried strap, comprising the step of forming a second conductive layer **overlying** the first conductive layer in the deep trench, wherein the second conductive layer is lower than the surface of the semiconductor substrate and **a portion of the second conductive layer is isolated from the semiconductor substrate by the second portion of the collar insulating layer**.

The examiner asserts that Divakaruni teaches a method of fabricating a trench device structure with a single-side buried strap, comprising the steps of: providing a semiconductor substrate having a deep trench therein (see Fig. 4); forming a buried trench capacitor 42 in a lower portion of the deep trench with reference to Fig.5; forming a collar insulating layer 36 lining an upper portion of the deep trench; forming a first conductive layer 42 overlying the buried trench capacitor in the trench and surrounded by and lower than the collar insulating layer by a predetermined height (see Fig. 5); removing a first portion of the collar insulating layer 36 from the deep trench to expose a first portion of the semiconductor substrate while a second portion of the collar insulating layer remains to isolate a second portion the semiconductor substrate (see Fig.5); forming a second conductive layer (strap polysilicon) overlying the first conductive layer 42 in the deep trench, wherein the second conductive layer is lower than the surface of the semiconductor substrate (see Fig.5); and forming the single-side buried strap region 31 in the semiconductor substrate directly contacting the second conductive layer without isolation by the collar insulating layer 36.

Thus, in the rejections, the Examiner relies on the strap polysilicon illustrated in Fig. 5 to teach the second conductive layer and doped polysilicon 42 to teach the first conductive layer of claim 1.

However, claim 1 recites that the second conductive layer is formed ***overlying*** the first conductive layer. The plain meaning of the term "overlie" is to lie on top of. To the contrary, Divakaruni teaches that the strap polysilicon is formed adjacent to doped polysilicon 42, as clearly shown in Fig. 5.

In addition, claim 1 recites that a portion of the second conductive layer is ***isolated from*** the semiconductor substrate by the second portion of the collar insulating layer. The Examiner relies on collar 36 to teach the collar insulating layer of claim 1. Presumably, the higher remaining portion of the collar 36 as shown in Fig. 5 is relied upon to teach the remaining second portion of the collar insulating layer as recited in the claim.

Given the context of the claim and the plain meaning of the terms, a person of ordinary skill in the art would understand that "a portion of the second conductive layer is isolated from the semiconductor substrate by the second portion of the collar insulating layer" in claim 1 describes that the second portion of the collar insulating layer keeps the second conductive layer apart from the semiconductor substrate. To the contrary, Divakaruni teaches that doped polysilicon 42 is interposed between the strap polysilicon and the higher remaining portion of the collar 36, as shown in Fig. 5. The higher remaining portion of the collar 36 does not contact the strap polysilicon and cannot be said isolate the strap polysilicon from the semiconductor substrate. Furthermore, the lower portion of the collar 36 on which the strap polysilicon is disposed does not isolate the strap polysilicon from the semiconductor substrate, as shown in the figure.

Applicant therefore submits that Divakaruni fails to teach or suggest a method as recited in claim 1 with the above-highlighted limitations. It is therefore Applicant's belief that the reference fails to teach or suggest all the limitations of claim 1. Applicant respectfully requests that the rejection of claim 1 be withdrawn and the claim passed to issue. Insofar as claims 2-14 depend

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from claim 1 either directly or indirectly, and therefore incorporate all of the limitations of claim 1, it is Applicant's belief that these claims are also in condition for allowance.

Rejections Under 35 U.S.C. 103(a)

Claim 12 is finally rejected under 35 U.S.C. 103(a) as being unpatentable over Divakaruni in view of Schrems. As noted above, it is Applicant's belief that claim 12 is allowable by virtue of its dependency from claim 1. For this reason, the Examiner's arguments in connection with this claim is considered moot and will not be addressed here.

Conclusion

The Applicant believes that the application is now in condition for allowance and respectfully requests so.

Respectfully submitted,

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